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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,196	06/30/2005	Hendrik Oevering	4662-39	7763

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EXAMINER	
VALENROD, YEVGENY	
ART UNIT	**PAPER NUMBER**
1621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/541,196	OEVERING ET AL.	
	Examiner	Art Unit	
	Yevgeny Valenrod	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3-19 remain rejected and new claims 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rulkens et al. (EP 0 005 291 A1) in view of Stemicarbon (British Patent 1,138,750) for reasons of record in the action of 3-15-07 and as set forth below.

Instant claims 1-19 are directed towards a process for preparing cyclohexanone oxime. The limitations of the said process include: A distillation procedure as described in claim 1, recycling of the distilled starting material and point of reintroduction of the recycled starting material into the oxime syntheses zone, concentration of the product discharged from the oxime syntheses zone (claim 6), concentration of cyclohexanone and cyclohexanone oxime in the aqueous discharge from the oxime syntheses zone

(claim10), solvent limitations (claims 17-18) and phosphate buffered aqueous medium (claim 19).

Determining the scope and contents of the prior art.

Rulkens et al. teach a method for recovering cyclohexanone oxime from a solution of oxime in toluene by distillatory separation wherein the solution to be distilled results from an incomplete conversion of cyclohexanone into cyclohexanone oxime. They teach that such a solution can be obtained by making a solution of cyclohexanone in toluene react with hydroxylamine salt dissolved in an aqueous buffered solution (page 1 lines1-10). Rulkens et al describe using two distillation columns, in which toluene is distilled off in the first column (first product according to instant claim 1), the remaining mixture is distilled in the second column where the oxime is separated as the bottom product (third product) and cyclohexanone is removed as a top product (second product) (page 3 columns 7-12). The distillation using two columns is described in example I (pages 3-4). According to the said example, the ratio of oxime/cyclohexanone is the second product is 48/177 (.27) (page 4 lines 2-3).

Ascertaining the differences between the prior art and the claims at issue.

The Process described by Rulkens et al. is a purification process and although they describe how the organic solution to be distilled can be obtained the details of the process are not taught by the disclosure. Rulkens et al. also fail to teach recycling of the second product into the oxime syntheses zone.

Resolving the level of ordinary skill in the pertinent art.

One of ordinary skill in the art is a chemical engineer. A chemical engineer of ordinary skill in the art has sufficient understanding of organic chemistry, is very familiar with various reactor types and is capable of making determinations as to what is the most efficient way to run a process.

Obviousness

Recycling of second product:

Recycling the unreacted starting material to back into the reactor is well known and in the art. Doing so offers a financial incentive and one of ordinary skill in the art would find such a step obvious.

Reaction conditions:

Numerous methods for preparation of cyclohexanone oxime from cyclohexanone and hydroxylammonium are known in prior art. A person skilled in the art would find it obvious that the distillation procedure described by Rulkens et al. has practical utility only when it is combined with a process for producing cyclohexanone oxime wherein cyclohexanone oxime produced contains a solvent and unreacted cyclohexanone. It is therefore obvious to combine the said distillation procedure with any such process. As an example, the process of British patent 1,138,750 ('750) can be modified with the distillation procedure of Rulkens et al. "750 describes a process where cyclohexanone oxime is prepared by reaction cyclohexanone (supplied in toluene) and an aqueous hydroxylammonium phosphate. The process is exemplified in figure I of '750. Fig I

shows the distillate from the distillation column (7) being delivered downstream from the cyclohexanone oxime removal line (9) and upstream the cyclohexanone/solvent feed (2) (the solvent and the ketone are supplied at the same level (limitation of claim 2). (stream moving in the direction of organic components (A to B)). '750 contacts the organic stream with a countercurrent of aqueous stream in the oxime syntheses zone.

In another process where cyclohexanone oxime is prepared according to the process of the instant invention, distillation is suggested as an energy efficient method of purifying the product (Blaauw et al. WO01/94297) (Page 6, lines 5-8). Using the distillation Rulkens et al. in such a process would be obvious to a person skilled in the art.

Concerning the amount of reagents feed into the cyclohexanone syntheses zone: "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). The limitation of claim 16 is obvious in view of In re Aller.

Concerning the location of the feed for the second product. One skilled in the art would find it obvious to place the feed for the second product at an appropriate location(s) in the cyclohexanone oxime syntheses zone. The placement of the feed falls under optimization conditions since it governs the concentration of the starting material in the given portion of the reactor.

Reply to Applicants' remarks

Applicant has argued the following:

1) In EP '291 the second product comprising cyclohexanone is not further used or treated and does not teach recycling of cyclohexanone and therefore does not teach the result of doing so (ie. contents of the aqueous stream).

2) GB '750 does not make use of a second distillation step and produces only 2 products the top being the recovered solvent, which is recycled into the bottom level (the extraction chamber) of the oxime synthesis zone.

3) Applicant draws attention to the comparative examples found in the specification.

Examiners comments:

There are 2 functional differences between the invention claimed by the applicant and the process found in GB '750. The first is the utilization of a second distillation column in order to obtain the second product (cyclohexanone). The second is the recycling the second product into the cyclohexanone oxime synthesis zone.

EP '291 is used to demonstrate that the method of recovering the second product (as defined by the applicant) via 2 distillations is known in the art.

GB '750 is used to demonstrate that a method of preparing cyclohexanone oxime comprising chambers (I) and (II) as depicted in applicants figure 1 is known in the art. Neither EP '291 nor GB '750 alone teach all the limitations of the instant claims. However, when the two teachings are combined together only one limitation present in the instant claim 1 is missing, the recycling of the second product downstream from the

organic feed to the cyclohexanone synthesis zone. There is no explicit disclosure in either reference that describes recycling of the second product.

The issues at hand become: 1) is it reasonable to combine the two references 2) if it is reasonable to combine them is recycling of cyclohexanone into cyclohexanone oxime syntheses zone obvious and 3) if one was to recycle cyclohexanone, at which point is it to be introduced to the reaction zone? 4) Applicant has drawn Examiners' attention to the alleged unexpected results. Are the results unexpected?

Combining GB '750 and EP '291 has motivation and expectation of success.

EP '291 teaches a process for recovery of cyclohexanone oxime. It specifically teaches that the method taught is different from the method utilized for recovery in '750 (page 1, lines 13-22). One difference is that cyclohexanone is recovered in EP '291. Since cyclohexanone is one of the reagents used in the process of '750, one of ordinary skill in the art would be motivated to recover for the purpose of recycling. There is reasonable expectation of success and motivation for combining the two teachings.

Recycling of cyclohexanone into cyclohexanone syntheses zone is obvious.

Once the EP '291 and GB '750 are combined as described above, one of ordinary skill in the art would find it obvious to recycle the second product. Besides the obvious financial incentives for recycling the second product there is a teaching in WO '297, which offers additional motivation. Applicant has sited this teaching in the first paragraph of page 12 of the remarks. The teaching provides reasoning for why it is beneficial to have higher concentration of cyclohexanone oxime exiting the synthesis zone. Adding more reagents (cyclohexanone) to the synthesis zone is a way to obtain

more product (cyclohexanone oxime) which would increase the cyclohexanone oxime concentration in the stream exiting the synthesis zone. Motivation to recycle cyclohexanone is therefore present.

Introducing cyclohexanone into cyclohexanone oxime synthesis zone downstream of the organic feed is obvious.

There are a limited # of options for introduction of the product 2 into the process.

1) Upstream of the organic feed into the synthesis zone.

Introducing cyclohexanone in such a way means introducing it into the extraction chamber (II). Doing so would increase the cyclohexanone concentration in the solvent supplied for the extraction of organic reagents from the aqueous stream and would therefore make the extraction of the said organic reagents less efficient. As a result the aqueous stream leaving the extraction zone will have a higher concentration of the organic reagents. One of ordinary skill would recognize that this is clearly not a preferred method of introduction because loosing organic reagents to the aqueous stream leaving the reactor reduces efficiency of the process.

2) At the same entry level as the organic stream vs. downstream of the organic stream.

In both these options the second product is introduced into the cyclohexanone oxime synthesis zone, which is a logical. One of ordinary skill in the art would be motivated to optimize the process and would therefore practice both of the above feed placements. It is obvious to choose either of two locations at the same level and downstream from the organic feed, because one of ordinary skill would immediately recognize the predictable effect on increasing efficiency.

Results summarized in table 1 on page 15 of the specification are not unexpected.

In examples I and II, the second product is introduced upstream of the organic feed to the synthesis zone. The resulting high concentration of oxime and anone is considerably higher than in experiments II through VI. Reasoning for this has already been discussed: "Doing so would increase the cyclohexanone concentration in the solvent supplied for the extraction of organic reagents from the aqueous stream and would therefore make the extraction of the said organic reagents less efficient. As a result the aqueous stream leaving the extraction zone will have a higher concentration of the organic reagents".

In question are examples III through VI where the concentration of the organic reagents in the aqueous stream decreases as the distance between the second product feed and the organic feed to the cyclohexanone synthesis zone is increased. **Such result is not unexpected**. One of ordinary skill would recognize that introducing the second product further downstream reduces the residence time of the second product in the reaction zone. Therefore, less of the cyclohexanone from the second product is absorbed into the aqueous stream.

Concerning new claims 20-25. New claims 20-25 include a limitation directed to the amount of cyclohexanone oxime and cyclohexanone present in the aqueous stream leaving the extraction chamber. One practicing the claimed invention would invariably obtain the claimed results. Since the invention is obvious, the results streaming from the invention are inherently obvious.

Conclusion

Claims 1 and 3-25 are pending.

Claims 1 and 3-25 are rejected.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yevgeny Valenrod whose telephone number is 571-272-9049. The examiner can normally be reached on 8:30am-5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler can be reached on 571-272-0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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